

ON *CTENOSTREON BURCKHARDTI*, N.SP., FROM THE MIDDLE
OOLITES OF SWITZERLAND.

By R. BULLEN NEWTON, F.G.S., etc.

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PLATE V.

RATHER less than two years ago, the British Museum was indebted to Professor Rudolph Burckhardt, of the University of Bâle, for some interesting material illustrative of a new species of *Ctenostreon*, which had been obtained by himself and his friend Dr. Ernst Sauerbeck from the *Macrocephalites macrocephalus* zone at Tschäpperli, near Bâle in Switzerland. Eight examples of the Lamellibranch were sent, the two best preserved forming the subject of the present communication. Included in the same donation were two specimens of *Ctenostreon pectiniformis* (Schlotheim) [= *Lima proboscidea*, J. Sowerby], which ranges through the Lower Oolite rocks into strata of Kimeridge age; these were sent for purposes of comparison. The particular zone yielding this new *Ctenostreon* represents the basal member of the Callovian period, and consequently forms part of the Middle Oolite deposits; the term Callovian being better known in England, perhaps, as the Kellaways Rock.

Dr. August Tobler, one of the latest writers upon the geology of this area of Switzerland, furnishes the following list of molluscan species characterizing the Callovian beds at Tschäpperli¹:—

- Macrocephalites macrocephalus* (Schlotheim).
- Perisphinctes triplicatus* (Quenstedt).
- Reineckia anceps* (Reinecke).
- Cosmoceras Jason* (Zieten).
- Pleuromya tenuistriata*, Agassiz.
- Rhynchonella triplicosa*, Quenstedt.
- Ctenostreon proboscideum* (J. Sowerby).
- Astarte*, sp.
- Cucullæa*, sp.

In remarking upon the genus it may be mentioned that *Ctenostreon* was established by Eichwald² in 1868 for the reception of two species: (a) *Ctenostreon distans*, Eichwald, from Russia, said to belong to the Neocomian, but in reality of Portland age (= *Olcostephanus virgatus* zone), and therefore Upper Oolitic; (b) *Ctenostreon proboscideum* (J. Sowerby), now regarded as synonymous with *C. pectiniformis*,

¹ "Der Jura im Südösten der Oberrheinischen Tiefebene": Verhandl. nat. Ges. Basel, vol. xi (1896), pt. 2, p. 306.

² *Lethæa Rossica*, vol. ii (1868), pp. 455-458, pl. xx, fig. 12.

Schlotheim, from the Oolite of England, Russia, South America,¹ and other countries.

The original diagnosis refers to the shell as being subequivalve, subequilateral, and radiately costated, with a cardinal margin auricled at both ends; the cardinal area includes a triangular, central, oblique, and oval fossula; on the anterior side is a prominent byssal orifice; the umbones are straight and acute.

Eichwald appreciated the fact that this genus combined the characters of *Ostrea*, *Pecten*, *Lima*, and *Spondylus*. He states that it is lamellose as in *Ostrea* and *Lima*, and slightly irregular as in both these genera, but the ribs are more regular than in the Oysters. Both valves are moderately convex and nearly equal as in *Lima*, both have wide expansions as in *Pecten*, and the ribs are mostly furnished with tubular prolongations as in *Spondylus*. The large opening for the passage of the byssus distinguishes it from *Lima* and *Spondylus*, whilst the shell is not fixed by its apex as in the Oysters, but by the byssus as in *Pecten*.

The geological distribution of *Ctenostreon* extends from the Lias through the Oolite period, when it attained its maximum development, into Cretaceous times; its occurrence in the Lias of Chili, South America, having been reported by Möricke² in 1894, whilst Stoliczka³ has identified certain forms in the Cretaceous strata of Europe and India.

CTENOSTREON BURCKHARDTI, n.sp. (Plate V.)

Shell large, thick, suborbicular, nearly equilateral, moderately convex, covered with undulating lamellæ of growth, costæ few (7 or 8), radial, elevated, rounded, forming fistulous plications and terminating in large cylindrical spines; interstitial spaces wide, excavated, equal; posterior ears vertically ridged, and with a well-defined border; anterior ears with a thickened, reflected margin, forming an elongate byssal orifice.

Dimensions of opposite valves belonging to different individuals:—

		Calculated without spines.	Calculated with spines.
LEFT VALVE	Umbono-ventral ...	134 mm.	195 mm.
	Antero-posterior ...	125 "	165 "
	Depth, about ...	40 "	
RIGHT VALVE	Umbono-ventral ...	150 "	155 "
	Antero-posterior ...	125 "	170 "
	Depth, about ...	45 "	

The principal points of difference between this shell and *C. pectini-formis*, to which it is most nearly related, are its fewer costæ, the presence of wider interstitial spaces, and the stronger development of the spinous prolongations. For purposes of comparison the number of ribs on the chief Jurassic species may be referred to as follows:—

¹ G. Steinmann: Neues Jahrbuch, 1881, Beilage Bd. i, p. 256 (Bolivia).

² "Versteinerungen des Lias und Unteroolith von Chile": Neues Jahrbuch, 1894, Beilage Bd. ix, p. 35.

³ "Cretaceous Pelecypoda of Southern India": Palæontologia Indica, 1871, pp. 414-416, 422.

